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# SPECIAL ISSUE—BART's NEW DALY CITY TURNBACK, YARD AND SHOP

BART

BARTalk

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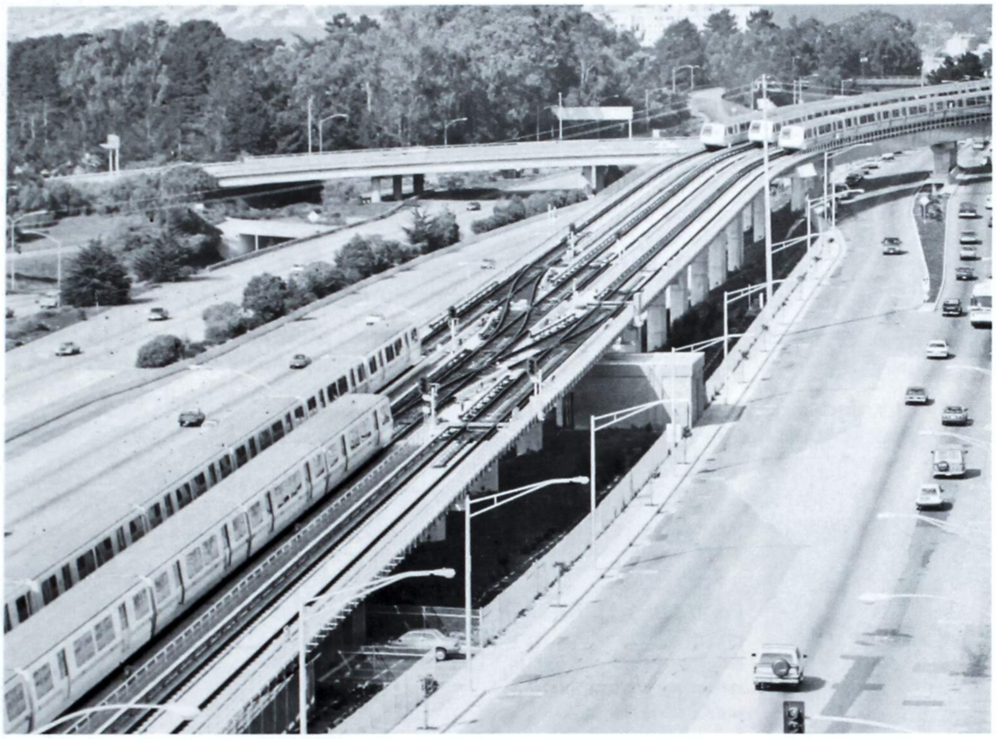
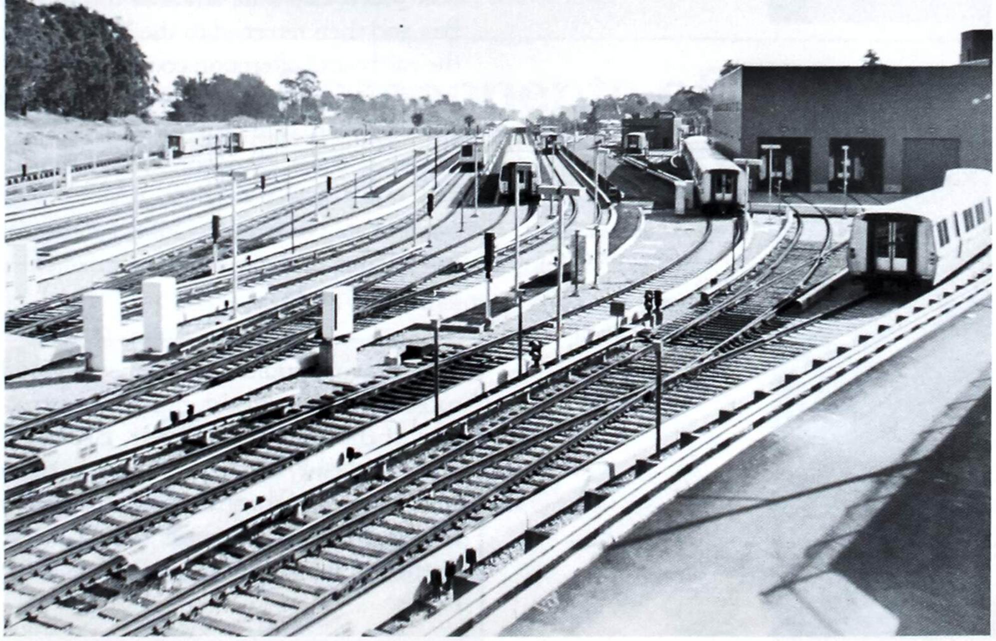


*Looking north toward San Francisco, with the first turnout in the center of the photograph. Out of view to the right is the Daly City Station.*

*(Below) The Daly City Yard, looking south into Colma, with the three-bay Shop at right. Gap in trees at left marks approximate line of extension to Colma and San Francisco International Airport.*



*Groundbreaking ceremonies in February, 1985, called for some muscle power from, from left, Wilfred Ussery, then President of BART's Board of Directors, Arthur Shartsis, former BART director, and then U.S. Senator Pete Wilson, now Governor of California.*

## Efficiency, Better Service, Dollar Savings Goals for Daly City

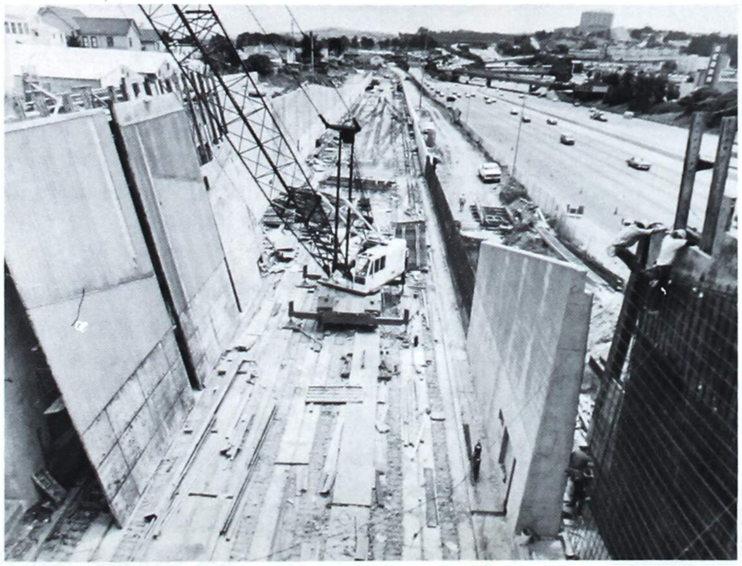
More efficient operations to provide better passenger service and save dollars was the driving reason behind BART's decision to build the Daly City Turnback and Yard.

The lack of turnback and yard facilities on the west side of San Francisco Bay at the Daly City terminus prevented the most efficient use of BART's passenger cars. Cars could not be stored at Daly City during the day to be made up into trains to carry eastbound commuters from San Francisco at the end of the afternoon.

*(See GOALS—page 4)*

*The end of the Turnback at Washington Street in Daly City, during excavation and grading in 1985. This view looks north and marks the point of interface between the future Turnback and Yard.*

*Putting down the concrete invert for the trackway and constructing retaining walls, looking south from School Street in Daly City.*



*The same view as in the photograph immediately above, showing the preparation of the forms for the 40-feet walls, 1986. Seton Hospital at right on hill.*

## What Did It Cost? Where Did the Money Come From?

What did it cost to build the Daly City Turnback and Yard, plus the Shop, and how did BART pay for it?

The approved budget for the Turnback and Yard was $161,030,508, approximately $71 million for the Yard and $50 million for the Turnback. The Shop was constructed and equipped for an additional $6.5 million, of which $5,200,000 was Federal contributions and $1,300,000 was BART Capital contributions.

The funds for the three components of the Daly City project came from state and federal grants and from BART capital expenditure.

Federal grants totaled $135,333,250; state grants totaled $965,294; and BART's capital contributions totaled $24,731,964, approximately 15 percent of the total.

## Daly City Project Will Help BART Cut PG&E Costs

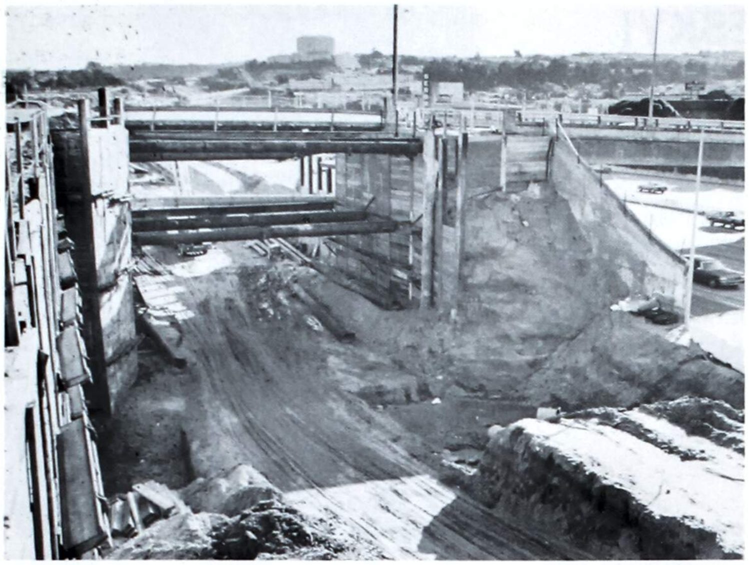
The new Daly City Turnback and Yard project will help BART to shave some dollars off of its Pacific Gas & Electric Company bill.

BART calculates that the new facility, by sharply reducing the need to dispatch trains for storage during the day at East Bay yards, will cut its power costs by more than $2 million a year. That works out to about $14,000 a day, including primary maintenance costs on the passenger cars that previously were shunted to the East Bay and then returned to the West Bay for the eastbound afternoon commute.

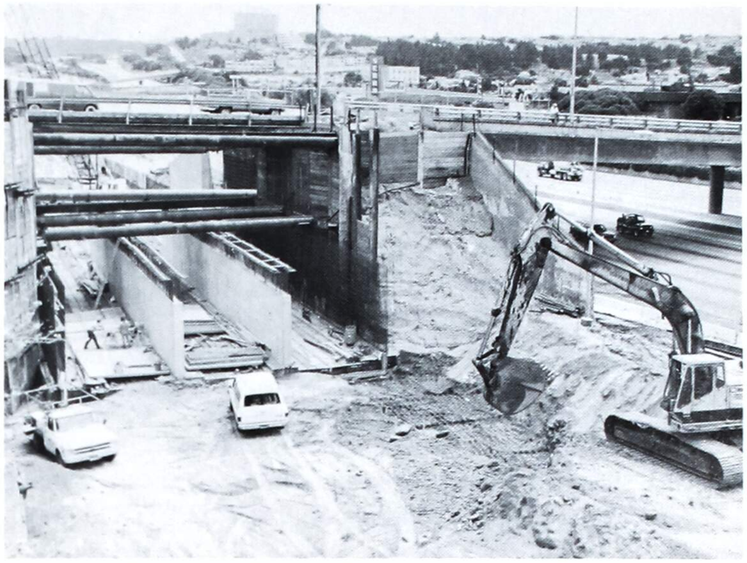
BART expects to spend approximately $15.6 million this year for electricity to power its trains throughout the District's 71.5 miles of double track. BART's total power costs per year, including lighting for its buildings and stations, is approximately $20.2 million.

To provide additional engineering and construction expertise during the construction of the Daly City project, BART retained DeLeuw, Cather, San Francisco, an engineering and construction management company. Project Manager for DeLeuw, Cather on the Daly City project was Brian Dykes.

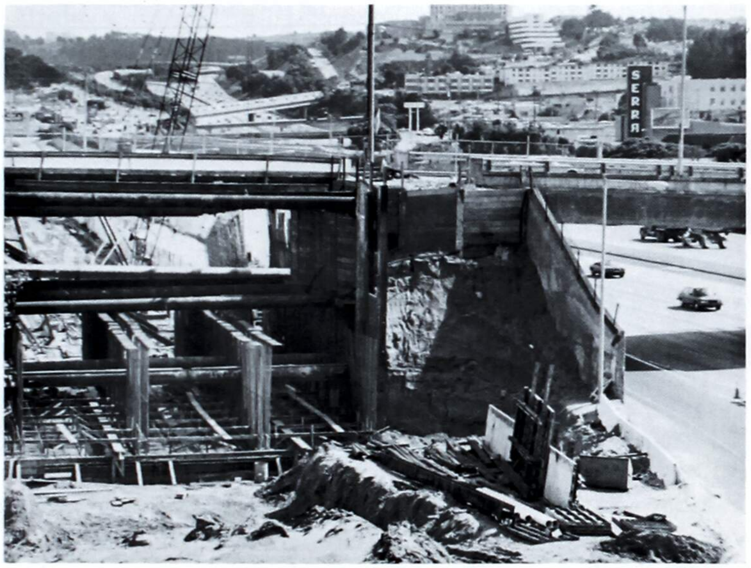
# Progress at School Street Overpass



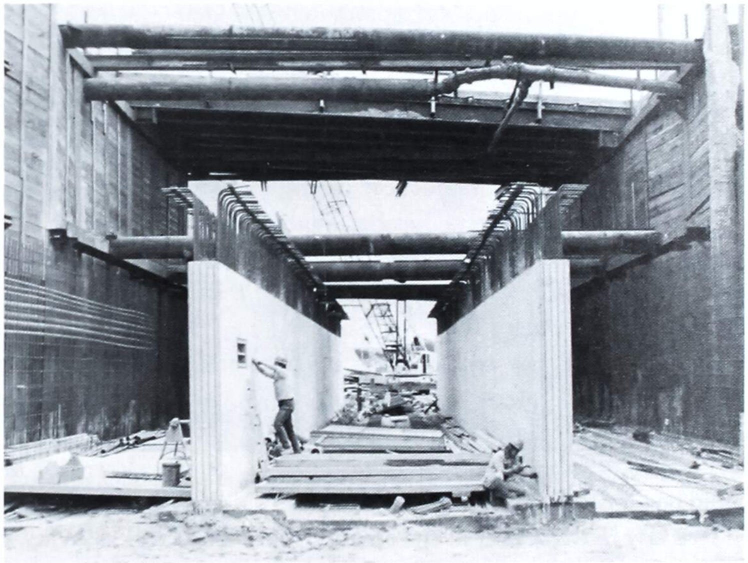
*Looking south at the School Street overpass, showing erection of the walls for the track and excavation and grading.*



*Late 1985 or early 1986, showing additional excavation, near completion of trackway box.*



*Same vantage point, fall 1985, showing the formation of the invert and the walls for the box carrying the trackway under School Street.*



*This view, taken on the same day as was the photograph at left, gives a closer look at the construction of the wallways between the tracks.*

# Components of Daly City Project

BART's Daly City Turnback and Yard project consisted of ten major components plus a common communications system. Those major components were:

### Turnback

1) Civic/Structures
2) Train control room
3) Track and contact rail installation
4) Traction power installation
5) Train control installation

### Yard

1) Utilities relocation
2) Civic/Structures
3) Track and contact rail installation
4) Traction power installation
5) Yard control

A separate shop for the yard, added to the plans after the initial design phase, was completed in July, 1989, at a cost of $6.5 million.

# SNAKES ALIVE! AND PESKY!

The not-so-common San Francisco garter snake is totally harmless to humans, but it threatened—at least, temporarily—to stop BART's Daly City Turnback and Yard project dead in its tracks.

During the preparation of the environmental impact studies required by both state and federal agencies on the Daly City project, BART found that the site of the Turnback and Yard was designated as the habitat of the once thriving small snake! The snake apparently was pretty much driven out of San Francisco as the city was built up so it took up residence in the open fields and pastures of San Mateo County. Garter snakes like wetlands and, according to an official state map, the project area was a wetlands. Wetlands? In Daly City?

The California Department of Fish and Game eventually certified that the project area, at one time a wetlands, and the snake's favorite habitat, had already been sufficiently "civilized" to drive away the garter snake to wetter pastures. Therefore, since most of the garter snakes had already slithered away, BART's project would not threaten their continued survival.

The preparation of the environmental reports began in the fall of 1980. By the time they were completed in December, 1982, BART figured it had heard the last of the San Francisco garter snake.

Oh yeah? Guess what critter just loves the open fields and marsh-like ground right were BART would like to build an Airport Station in the next five years?

**GOALS**—*from page 1*

Trains that carried San Francisco-bound commuters in the morning had to be returned to East Bay yards during the day and then routed again to Daly City early in the afternoon to return with commuters to the East Bay. This situation was foreseen, of course, when BART's system was originally conceived in the 1960s, but there simply were not sufficient funds available during the construction of the original system to include a Turnback and Yard at Daly City. Very limited turnback and storage facilities were constructed in conjunction with the Daly City Station, but BART directors and officials knew that these facilities were merely a stopgap and they looked forward to the day when full-fledged turnback and yard facilities could be funded and constructed.

That day moved closer at the end of the 1970s when BART committed itself to expanding the District's capacity to carry passengers at more frequent intervals. At that time, the minimum headway (the time interval between the arrivals or departures of trains) at the Daly City Station was 3.75 minutes. (This headway was due not entirely to the indadequate turnaround facilities at Daly City. Other factors included the number of cars available every day for passenger service, the train control system existing at that time, the need for additional track under downtown Oakland to provide greater efficiency in routing and storing cars).

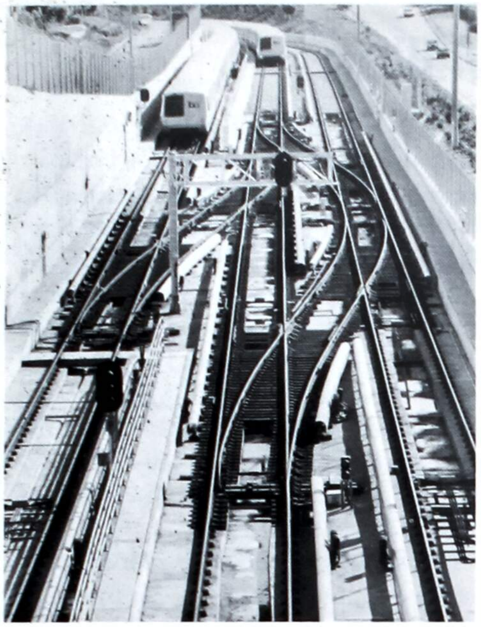
The construction of the Daly City Turnback and Yard was a key component of the Capacity Expansion program approved by BART directors at a cost of just under $500 million. Of that program, only the acquisition of 150 new passenger cars at a cost of $228, exceeds the cost of the Daly City project, which totals $161,000,000. The Daly City project, however, is certainly the largest construction project undertaken by BART since the completion of the original system in 1974. (Passenger service began on both sides of the bay in 1972, but the completion of the Transbay Tube and full system-wide service did not occur until 1974.)

BART estimates that it will save $1.6 million a year in costs related to returning cars to East Bay yards for storage during the day. These costs are primarily the costs of the electricity required to shuttle the cars to the yards in the East Bay and then back to Daly City. Now as the cars complete their commute runs into San Francisco they can be stored at Daly City until required for service for the eastbound afternoon commute.

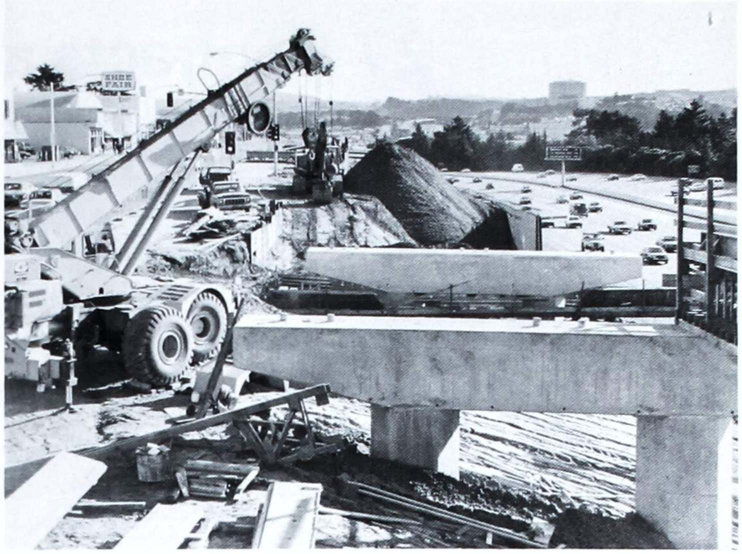
The daily movement return of cars each day to East Bay yards also took its toll in costs of more frequent preventive maintenance and repairs. BART removes cars from passenger service, of course, due to malfunctions. The more miles of continuous service a car accumulates the more susceptible it is to a malfunction. BART also removes cars from passenger service at regular intervals for preventive maintenance, whether or not those cars exhibit indications of a possible malfunction. The faster a car accumulates miles in service, whether it's carrying passengers or being shunted to a storage yard, the sooner it will be pulled from service and dispatched for maintenance. Thus, the additional miles logged by cars on their way to an East Bay storage facility quickened the pace at which they were removed from passenger service and were not available to be made up into trains for normal daily service carrying passengers.

Having more cars available on the west side of the Bay also helps BART in its goal to put more trains into service on the system and to operate those trains at closer intervals than is now possible. The Daly City facilities are linked to current changes in BART's train control system, which will allow closer intervals between trains than could be scheduled with BART's original train control system. The availability of more cars to be scheduled from Daly City, plus the improvements to the train control system, are linked to BART's purchase of 150 new passenger cars. Adding the new passengers cars, in turn, would not have proved practical unless BART also undertook the additional storage facilities at Daly City.

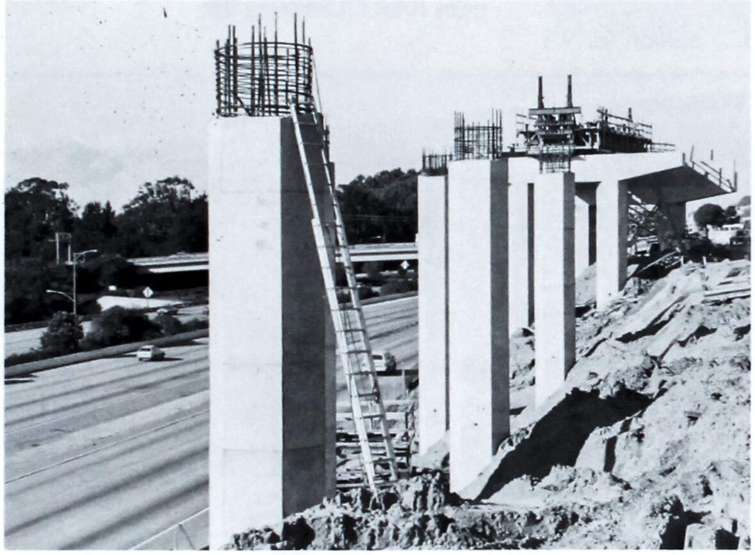
The new Turnback and Yard facilities, in conjunction with other BART capacity expansion improvements still in progress, will enable trains bound for the East Bay to eventually operate at headways of two minutes and thirty seconds, a critical factor in providing better service to BART passengers during peak commute hours. BART's objective is to be able to operate 51 trains on the system at one time, compared to the current limit of 47.



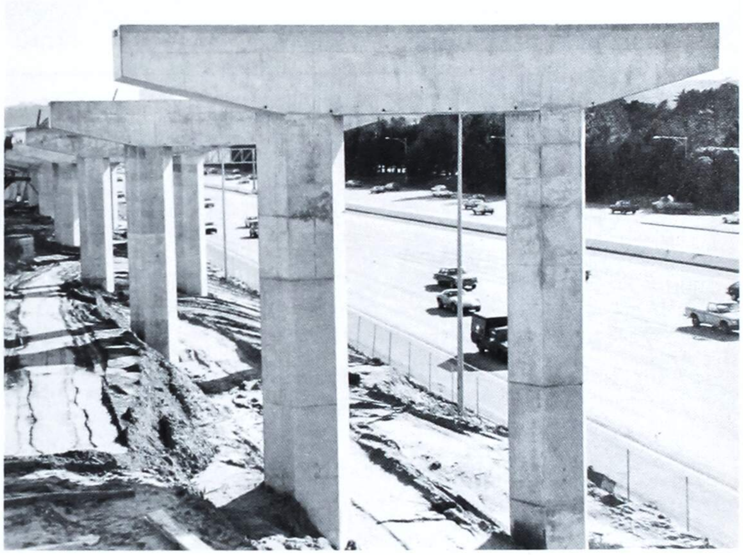
*Turnout No. 3 at south end of Turnback, looking south, 1989.*



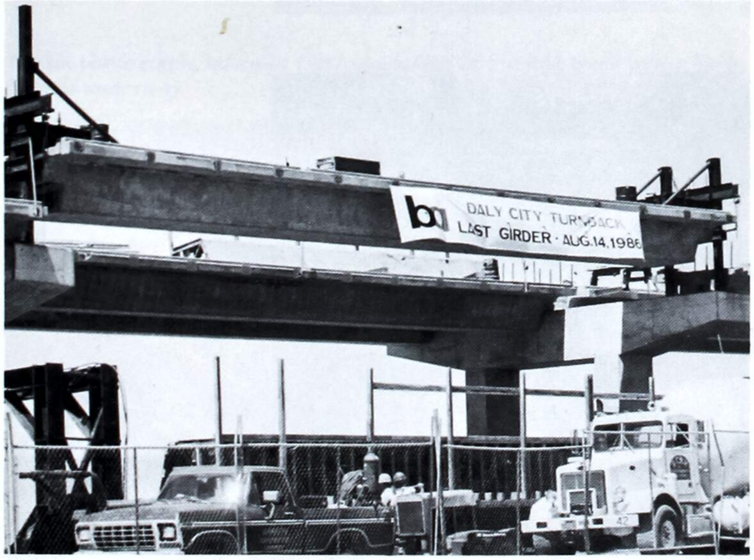
*Looking south at the transition between the 2,125-foot aerial portion and the invert section of the Turnback under construction.*



*Looking north from a point midway along the aerial structure and supporting columns under construction.*



*Looking south from the same position as the photograph at left.*



*The last girder for the elevated structure was put into place in August, 1986.*

*Wilfred Ussery, then President of BART's Board of Directors, seems to gaze thoughtfully at the final weld on the last of 1,286 sections of rail used on the Daly City project, January, 1985.*

# 27 Contracts and $155 Million

The opening of the Bay Area Rapid Transit District's Daly City Turnback and Yard project brought to a close more than a decade of planning, building and testing to provide efficient storage and train make up facilities on the west side of San Francisco Bay.

It was on May 22, 1980, that BART's Board of Directors approved a contract with Parsons Brinckerhoff Quade & Douglas, Inc. (PBQ&D), a San Francisco engineering firm, for the preliminary engineering of the Turnback and Yard Project. That contract amounted to $940,000 and was funded by the California Transportation Commission (CTC).

That contract to PBQ&D was one of 27 contracts totaling $155 million eventually awarded during the project, including 18 contracts for constructions and installation.

PBQ&D completed the initial engineering in February, 1983. BART directors approved the location and alignment of the project and in April awarded to PBQ&D a contract for $5 million for final detail engineering design and for design services during construction.

While the detailed engineering was on the drawing boards, BART selected De-Leuw Foster-Francis, a joint venture, to serve as the contract management team at a cost of nearly $4 million.

By February, 1984, with the start of construction more than a year away, BART awarded a contract of $2.5 million for 9.5 miles of rail for the Turnback and Yard (plus an additional 5.8 miles of track for routine District maintenance). Plans called for the Daly City project to include three parallel tracks extending south from the existing Daly City Station on a 2,125-foot long elevated section and then into a series of covered and uncovered below-ground sections to reach the Yard, which is actually in Colma. The storage capacity of the Yard was set at 165 cars. All of the 9.5 miles of track for the project were welded at BART's Hayward Yard.

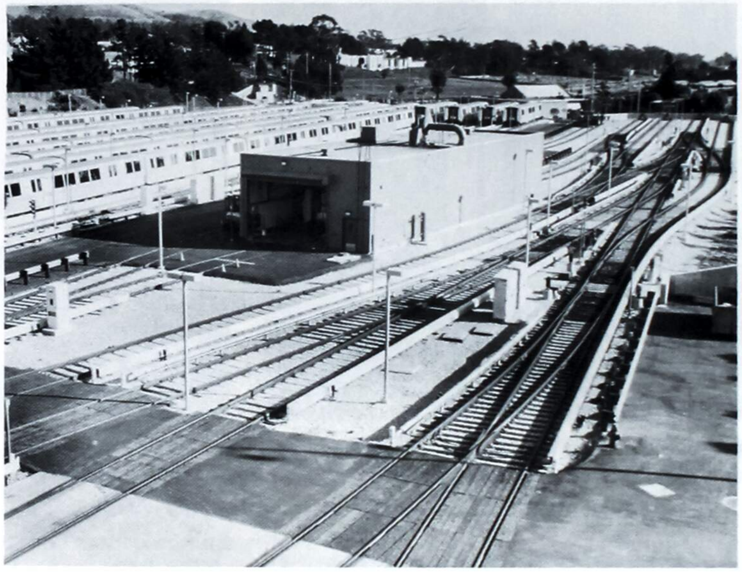
The official groundbreaking for the project was held in February, 1985, five years after PBQ&D had received the "go ahead" from BART Directors.

## Daly City Shop Bonus for Entire Project

The maintenance and repair shop at BART's new Daly City Turnback and Yard can be regarded as a bonus for the entire project.

The Shop was not originally included in the plans for the Turnback and Yard in the early 1980s. It seemed at that time that funds simply were not available to cover the cost of a new shop—approximately $6.5 million.

The Shop provides for preventive maintenance, repairs and cleaning of BART cars. Without shop facilities on the west side of the Bay, cars scheduled for regular preventive maintenance and repairs would have to be returned to one of the three shops in the East Bay.



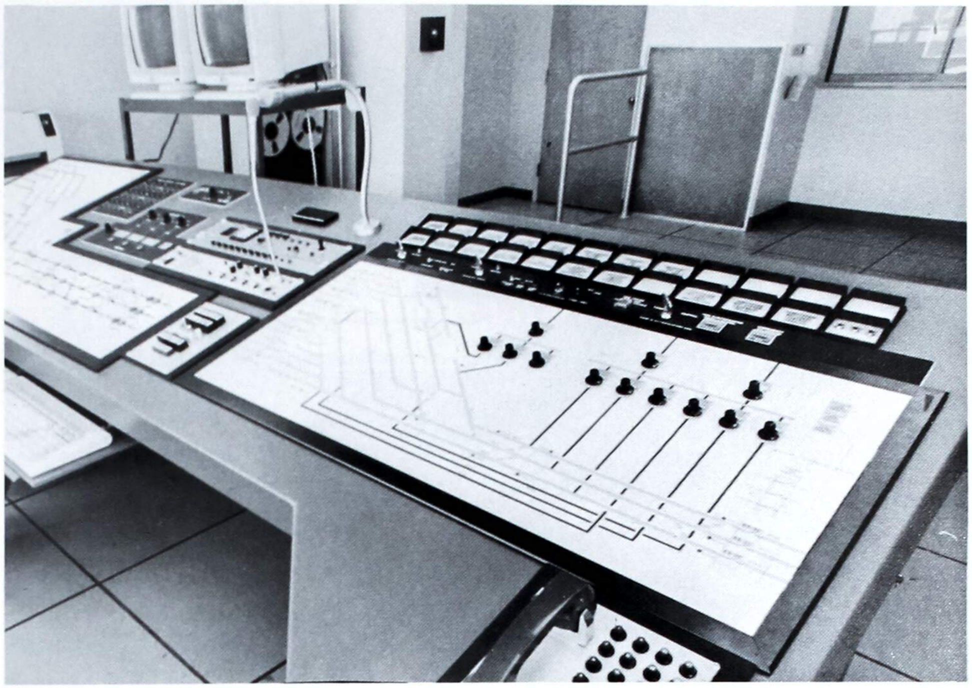
*Looking south at the Yard and at the blowdown pit, 1989.*

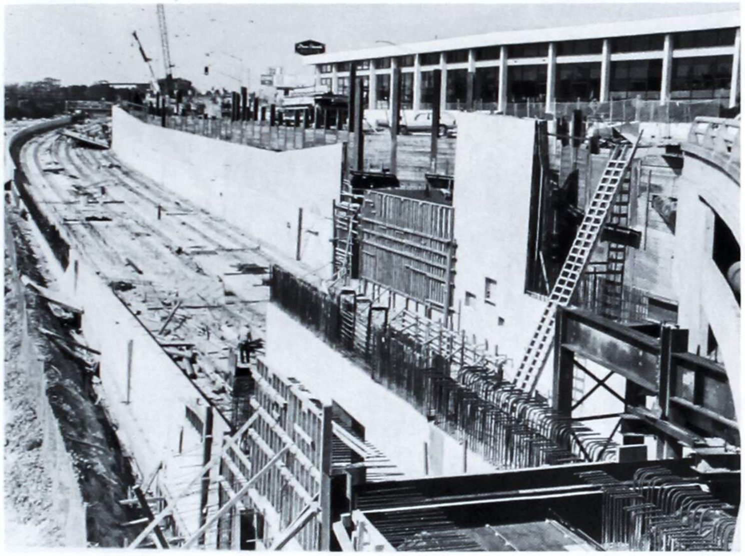
*BART cars on two of the three bays at the Daly City Shop. The Shop was completed in 1989 at a cost of $6.5 million.*

### Editor's Note:

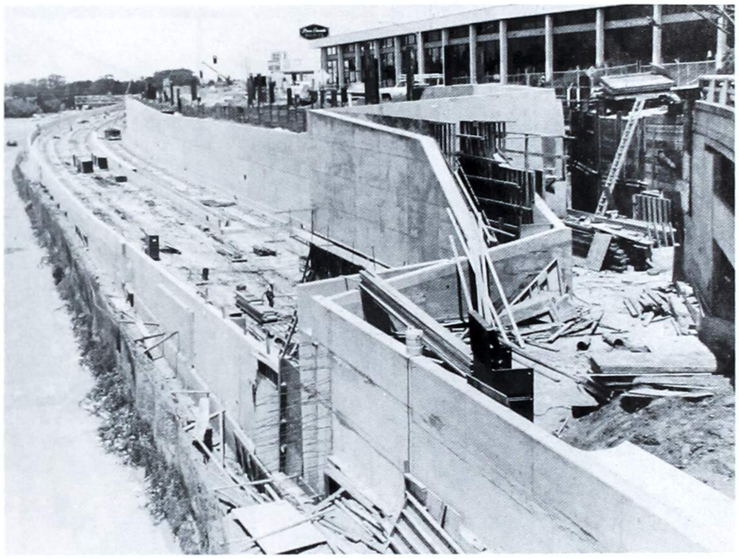
*BARTalk owes a special thanks to Robert W. Mix for his advice and cooperation in the preparation of this special issue. Now Project Manager for West Bay Extensions, Mix was Project Manager for BART from start to finish of the Daly City Turnback and Yard project. Mix is scheduled to retire from BART early in May.*

*The nerve center of all train movement and storage at the Daly City facility is the control board in the Tower. The board provides a representation of all track and switches in the Yard and shows the position of all trains in motion and all cars parked in storage.*



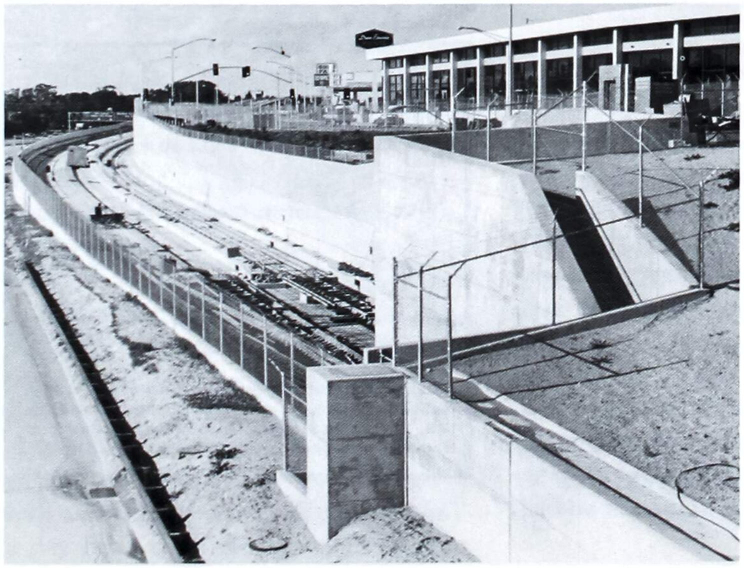


*Looking north from the Junipero Serra overpass. The construction worker stands on the site of the future crossover to the second Turnback.*

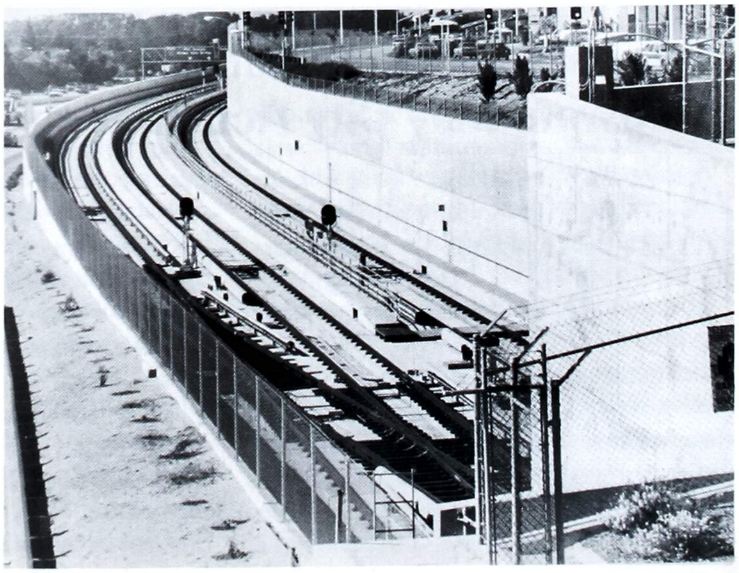


*The same view, taken within a few months of the photograph at left.*

*In this photograph, taken in 1987, the laying of the first track in the Turnback is underway.*



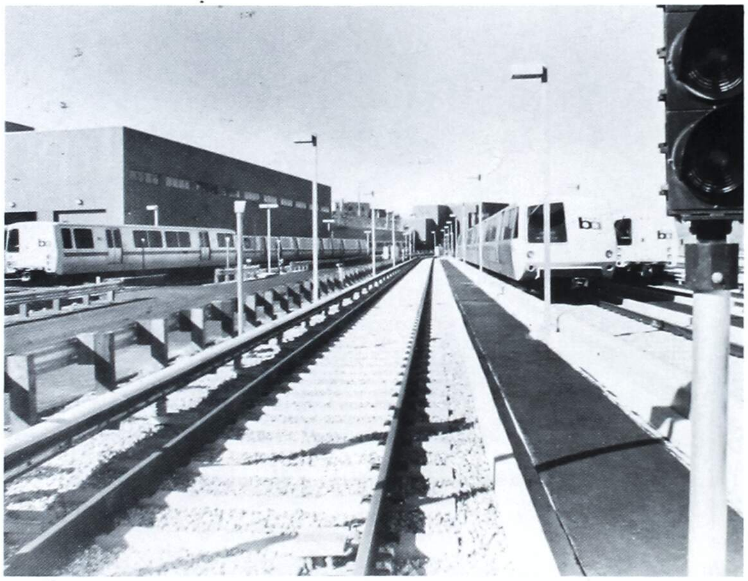
*This view, taken a year later than the photograph at left, shows the completed crossover into the second Turnback, including signals.*



*(Left) Cars in storage at the south end of the Daly City Yard. West Bay storage is expected to save BART $1.6 million a year in deadheading costs.*

*(Below left) Looking north from Yard. Shop at left. The Daly City project was the largest construction project undertaken by BART since the completion of the original system.*

*(Below right) Looking south near the Daly City Station, late 1988 or early 1989.*



## Separate Electric Substation Powers Daly City Activities

A separate electrical substation with a capacity of 34,500 volts (34.5kv) was installed as part of BART's Daly City Turnback and Yard.

The substation supplies power for the movement of trains over the Turnback and throughout the Yard. It is one of 41 34.5kv substations throughout BART's system. Power from the substation reaches the third rail through a rectifier at 1,000 volts.

BART's Department of Power and Way was responsible for the installation of the substation, as well as for the laying of the track in the project, including the third rail, and for all testing of track, interlocking switches, train control equipment and the activation of all controls in the Yard Tower.

In the Tower, a control board gives a representation of all track and switches on the Turnback and Yard, as well as showing the position of all trains in motion and all cars parked in storage.

**BARTalk**

*A publication for and about the employees of the San Francisco Bay Area Rapid Transit District.*

**800 Madison St., Oakland, CA 94607**

**Frank J. Wilson ................... General Manager**
**Mike Healy ............ Dept. Manager, Public Affairs**

**BARTalk Staff**

**Sy Mouber ........................ Managing Editor**
**Vicki Wills ........................... Circulation**
**Art Richardson ........................ Staff Artist**

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*The photographs in this special issue were taken by Gordon Kloess.*